Package 'PESAII'

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Type Package
Title Pareto Envelope-Based Selection Algorithm Version II
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Author Dennis Assenmacher, Christian Homberg
Maintainer Dennis Assenmacher <dennis.assenmacher@uni-muenster.de>, Christian Homberg <c_homb01@uni-muenster.de></c_homb01@uni-muenster.de></dennis.assenmacher@uni-muenster.de>
Description PESA-II implementation based on R. Provides the PESA-II function as well as related functions for crossover, mutation, domination, hypergrids, and the visualization of pareto fronts.
License GPL (>= 2)
Imports Rcpp (>= 0.11.6),ggplot2
LinkingTo Rcpp
R topics documented: createGrid
PESAII
printParetroFrontPESA
Index
createGrid Dominated points
Description
This function is responsible for creating a multidimensional grid
Usage
createGrid(ep, ngrid)
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2 dominates

Arguments

ep, ngrid

Value

hypergrid that contains all intervals

Author(s)

Dennis Assenmacher

crossover

PESA-II Crossover

Description

Uniform crossover between two individuals

Usage

```
crossover(v1, v2)
```

Author(s)

Dennis Assenmacher

dominates

Dominated points

Description

Calculates whether a vector x domonates another vector y

Usage

```
dominates(x, y)
```

Arguments

x, y Vector that holds fitness values.

Value

TRUE if x dominates y, FALSE if x does not dominate y

Author(s)

Dennis Assenmacher

Examples

```
dominates(c(3,2),c(5,6)) == TRUE
```

mutate 3

mutate

PESA-II Mutate

Description

Gaussian mutation of one individual

Usage

```
mutate(sol, min, max, sigma = 0.3)
```

Arguments

min Minimum value after mutation
max Maximum value after mutation

sigma Variance

Author(s)

Dennis Assenmacher

nonDominatedSolutions Non-dominated solutions

Description

Calculates all entries which are not dominated by any other entry.

Usage

```
nonDominatedSolutions(obj)
```

Arguments

m

Matrix or data.frame that contains rowwise entries.

Value

Matrix which contains all non-dominated points

Author(s)

Dennis Assenmacher

Examples

```
nonDominatedSolutions(mtcars[,c("mpg","hp")])
```

4 PESAII

nonDominatedSolutionsC

Non-dominated solutions

Description

Calculates all entries which are not dominated by any other entry.

Usage

```
nonDominatedSolutionsC(obj)
```

Arguments

m

Matrix or data.frame that contains rowwise entries.

Value

Matrix which contains all non-dominated points

Author(s)

Dennis Assenmacher

Examples

```
nonDominatedSolutionsC(mtcars[,c("mpg","hp")])
```

PESAII

PESAII

Description

PESAII

Calculates a list of solutions of a given multiobjective optimisation problem by using the PESA-II algorithm.

Usage

```
PESAII(ipMax, epMax, gens, vmin = 0, vmax = 1, nvar = 6, fn, data, nn, neighborhoodMutationMatrix, initialPopulation = NULL, crossRate = 0.7, sigma = 0.5, nGrid = 20, mock = F, L = 10, printN = NULL)
```

printParetroFrontPESA 5

Arguments

ipMax Maximum size of internal solutions used to explore new potential solutions.

epMax Maximum size of external population.

gens Number of generations.

vmin minimum of parameter space variable.vmax maximum of parameter space variable.

nvar Dimensions of paramaterspace.

fn Multiobjective function that should be optimised.
data Data set as matrix on which to apply PESAII.

nn Nearest neighbors matrix of data.

neighborhoodMutationMatrix

Neighborhood matrix which mock mutation is based on.

initialPopulation

Initial population provided by mock wrapper.

crossRate Probability for parenting.

sigma Standard deviation for mutate function.

nGrid Number of grids.

L Number of nearest neighbors to consider for mutation and mock function.

printN Generation interval in which to print progress of function. Progress bar is dis-

played, if null.

Author(s)

Dennis Assenmacher

Dennis Assenmacher

printParetroFrontPESA PrintCurrentSolutions

Description

Visualizes a 2 dimensional solution of PESA-II

Usage

printParetroFrontPESA(sol)

Arguments

ep External population returned by PESA-II

Author(s)

Dennis Assenmacher

Index

```
createGrid, 1
crossover, 2

dominates, 2

mutate, 3

nonDominatedSolutions, 3
nonDominatedSolutionsC, 4

PESAII, 4
PESAII-package (PESAII), 4
printParetroFrontPESA, 5
```